

CLAIMS

1. A method for measuring the thickness of a layer of an integrated circuit in real time, said layer to be measured being deposited on an underlying layer, said method being operated through an engraving reaction during a process of engraving the substrate of said integrated circuit incorporating these layers, said method comprising:

- tracking the advance of the engraving front of each integrated circuit layer by plotting the optical emission spectrum of the product of said engraving reaction in real time on at least one spectral component of said layer;
- establishing a distribution of the optical emission amplitude of said engraving reaction product as a function of time;
- determining, on said distribution, the transition of the optical emission amplitude as said engraving front passes from said layer to be measured to said underlying layer;
- computing the thickness of said layer to be measured, on the basis of said distribution and said transition, by correlating said transition to said distribution.

2. The method of claim 1, wherein said spectral component of said underlying layer is a perceptible emission wavelength characteristic of said underlying layer.

3. The method of claim 1, wherein for a layer to be measured being the second layer of silicon oxide and the underlying layer is a barrier layer of silicon nitride

of said integrated circuit, said spectral component of said underlying layer is the spectral line SiN at 405 nm.

4 The method of claim 1, wherein said correlation, on this distribution, to the transition of
5 the optical emission amplitude is proportional to the engraving time between the optical emission amplitude at the start of engraving, constituting a reference amplitude, and an increase of 50% in this reference amplitude on said distribution.

10 5. The method of claim 4, wherein said thickness of said layer to be measured is computed on the basis of a linear combination linking said engraving time and the calculated thickness of the layer to be measured.

15 6. The method of claim 1, wherein the step consisting in monitoring the advance of said engraving front is performed by means of a monochromator.

20 7. A device for measuring the thickness of a layer of an integrated circuit in real time, said layer to be measured being deposited on an underlying layer, said device comprising at least in combination:

- a reactor for engraving an integrated circuit substrate, said reactor being fitted with an optical window F enabling the engraving product to be optically observed;
- 25 - a monochromator, the wavelength of which is centred on a characteristic value of said underlying layer enabling amplitude values for the optical emission of the engraving product to be produced;
- means for computing the position of the time taken for
30 the engraving front produced within said reactor to reach the underlying layer and the effective thickness

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A1

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B1